

# NEW SPECIES OF FROGS FROM LOW AND MODERATE ELEVATIONS FROM THE CALDAS TRANSECT OF THE EASTERN FLANK OF THE CORDILLERA CENTRAL

por

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## Resumen

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Cuatro especies adicionales del género *Eleutherodactylus* se registraron de la parte oriente del departamento de Caldas, Colombia. Con estas, conocemos 28 especies del género sobre un perfil comprendido entre los 600 y 2650 m.s.n.m. Se registra *Eleutherodactylus orpacobates* por primer vez afuera de la Cordillera Occidental. Se nombran tres nuevas especies.

**Palabras clave:** Colombia, *Eleutherodactylus*, Leptodactylidae, Especies nuevas

## Abstract

Four additional species of *Eleutherodactylus* are reported from eastern Caldas, Colombia, bring to 28 the number of species known along a transect between 600 and 2650 m. *Eleutherodactylus orpacobates* is reported for the first time away from the Cordillera Occidental and three species are named as new.

**Key words:** Colombia, *Eleutherodactylus*, Leptodactylidae, New species

## Introduction

Between November 1992 and June 1994, the junior author made a series of collections of frogs in eastern

Departamento Caldas at elevations between 1000 and 2650 m.s.n.m. Additional collections were made by la bióloga Mariela Osorno and by field parties from the Instituto de Ciencias Naturales in Municipio Samaná at elevations between 600 and 1500 m.s.n.m. during the same interval. Subsequently, Jeanette Nieto, Mariela Osorno y Claudia Vélez made collections in forest

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fragments in eastern Departamento Antioquia, just to the north of the Caldas transect.

The eleutherodactyline frogs collected in the higher parts of these transects were described in a series of papers (Lynch, 1997; Lynch & Rueda, 1997, 1998 *a y b*) and this paper treats the species found in the lowest part of the transect. Lynch & Rueda (1998 *b*) included the then-undescribed species named here in their summary of distributions of species along the transect.

## Materials and Methods

Terminology and methods follow Lynch & Duellman (1997). The following abbreviations are used in species accounts: E-N (eye to nostril distance), HW (greatest head width), IOD (interorbital distance), SVL (snout to vent length). Specimens were also studied from the collections of the Instituto Alexander von Humboldt (IAvH, formerly IND-AN, INDERENA), Villa de Leyva, and the museum of herpetology, Universidad de Antioquia (MHUA), Medellín.

### *Eleutherodactylus orpacobates* Lynch, Ruiz & Ardila

Three specimens of this species (IAvH 5597-98, CALDAS, Municipio Samaná: vereda San Lucas, 1100 m; and IAvH 5598, Quebrada Mercedes, 1200 m) are available and provide the first record of this species away from the northern and western slopes of the Cordillera Occidental (Lynch *et al.*, 1994). This record might be seen as astonishing except that a good number of species "typical" of the biogeographic Chocó have been found along this transect, both in the lower part as well as in the upper part.

### *Eleutherodactylus fallax* sp. nov.

**Holotype:** Amphibian collection of Instituto de Ciencias Naturales, ICN 40795, an adult male, obtained 22-26 February 1998 by Mariela Osorno (original number MOM 1092).

**Type-locality:** ANTIOQUIA, Municipio San Rafael, bosque de San Rafael, cerca Estadero El Bizcocho, aprox. 1200 m.s.n.m.

**Paratypes:** ANTIOQUIA, Municipio San Carlos: Bosque San Carlos, 1180 m.s.n.m. (ICN 40796-97). CALDAS, Municipio Samaná, San Lucas, 1100 m.s.n.m. (IAvH 5600).

**Referred specimens (juveniles):** Antioquia, Amalfí: vereda La Guyana, 1400 m (MHUA 687). San Carlos: Bosque San Carlos (ICN 42420-21). Caldas, Samaná:

Rancho Quemado, aprox. 6 km SW Florencia, 1850 m (ICN 40792-93); carretera Samaná a Florencia. Km. 4.4, La Palma, 1385 m (ICN 40794).

**Etymology.** Latin, *fallax*, meaning deceitful, in reference to the throat pattern that resembles that of *E. fitzingeri*.

**Diagnosis.** (1) Skin of dorsum shagreen, that of venter smooth anteriorly, weakly areolate posteriorly; no dorsolateral folds; (2) tympanum round in males, slightly higher than long in females; (3) snout subacuminate in dorsal view, rounded in lateral profile, long; (4) upper eyelid lacking pungent tubercles, broader than IOD; no cranial crests; (5) vomerine odontophores prominent, subtriangular in outline, closely juxtaposed; (6) males with vocal slts, nuptial pads; (7) first finger longer than second; broad disks on outer fingers; (8) fingers lack lateral fringes; (9) ulnar tubercles indistinct; (10) minute tubercles on heel and outer edge of tarsus; short inner tarsal fold; (11) two metatarsal tubercles, inner elongate, ca. 8 times size of outer; few supernumerary plantar tubercles; (12) weak lateral fringes on toes, no webbing; toe disks slightly smaller than those of fingers; fifth toe slightly longer than third; (13) gray to light brown with indistinct darker brown markings dorsally; posterior surfaces of thighs brown; ventral surfaces cream; lateral portions of throat reticulated with gray to black, defining cream central raphe on throat; (14) adults of moderate size, two males 26.8 mm, two females 37.1-45.1 mm SVL.

*Eleutherodactylus fallax* is most distinctive for its throat pattern (Fig. 1), a feature otherwise known in only three species of *Eleutherodactylus* — *E. gutturalis* and *E. lanthanites* of the *conspicillatus* group and *E. fitzingeri* of the *fitzingeri* group of the subgenus *Craugastor*. Although superficially resembling *E. fitzingeri*, *E. fallax* is easily distinguished because its fifth toe is slightly longer than the third (reverse in *E. fitzingeri*), it lacks webbing of the toes (basally webbed in *E. fitzingeri*), the skin of the dorsum is shagreen (bearing numerous low warts in *E. fitzingeri*), and the posterior surfaces of the thighs are unicolor (bearing pale spots in *E. fitzingeri*). *Eleutherodactylus lanthanites* has a prominent subconical tubercle on the upper eyelid and a prominent conical tubercle on the heel (each lacking in *E. fallax*) and is a short-limbed frog. *Eleutherodactylus gutturalis* closely resembles *E. fallax* but has larger warts scattered over the shagreen dorsum and lacks lateral fringes on the toes.

**Description** (proportions based on the four adults as well as two juvenile females). Head broader than body (except in gravid females), longer than wide; HW 38.1-

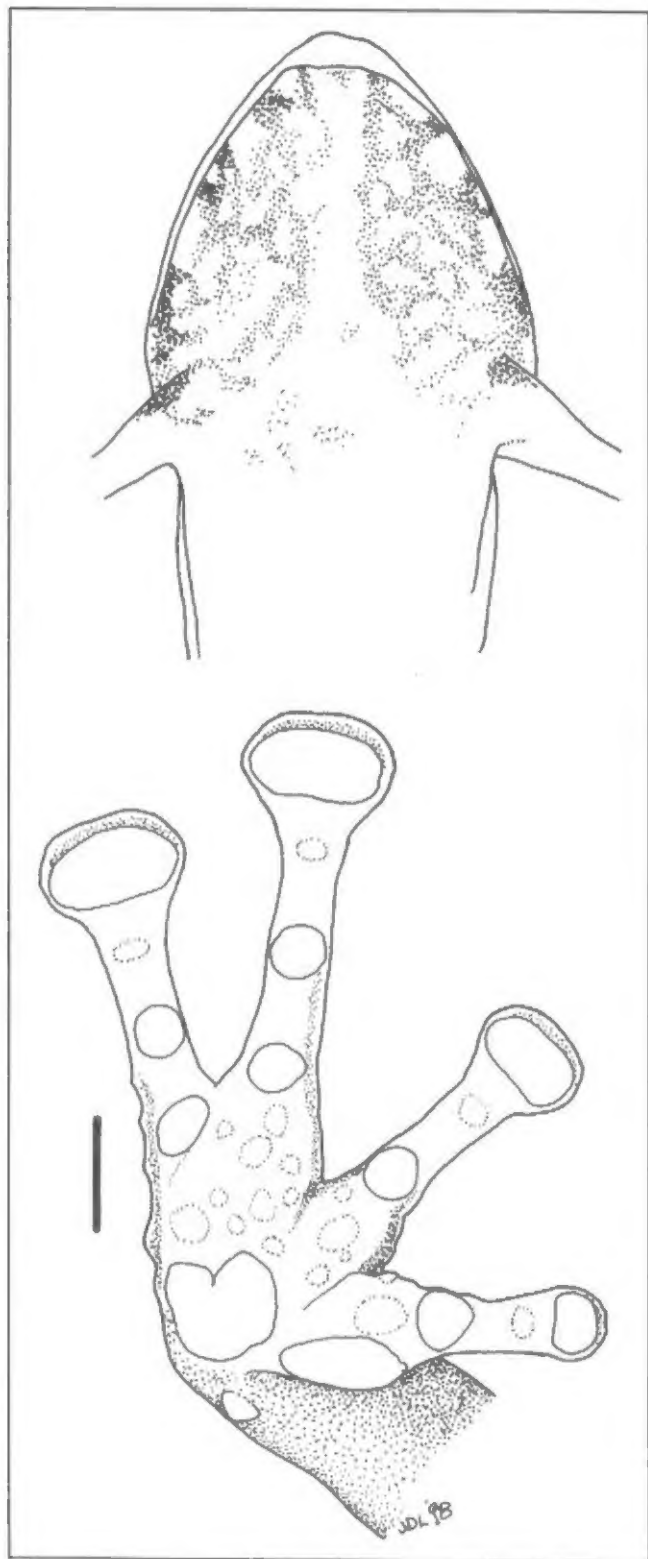


Figure 1. Ventral view of throat of male *Eleutherodactylus fallax* (ICN 40796). Palmar view of hand of *Eleutherodactylus penelopis* (ICN 42460); scale equals 2 mm.

39.6 % SVL in males, 34.0-39.6 % in females; snout subacuminate in dorsal view, rounded in lateral profile; E-N 100.0-105.7 % eye length in males, 104.1-112.2 % in females; nostrils weakly protuberant, directed dorsolaterally; canthus rostralis relatively sharp, sinuous; loreal region weakly concave, sloping abruptly to lips; lips not flared; upper eyelids lacking enlarged warts or tubercles; upper eyelid width 104.5-118.2 % IOD in males, 89.1-113.8 % in females; no cranial crests; supratympanic fold evident, ending just behind tympanum; tympanum round in males, slightly higher than long in females, its length 34.3-43.2 % eye length in males, 29.4-38.9 % in females, separated from eye by distance equal its length; postriatal tubercles not prominent; choanae large, round, well medial of maxillary arch; vomerine odontophores median and posterior to choanae, subtriangular in outline, each about size of a choana, separated medially by distance less than  $1/3$  width of an odontophore in adult females, by about  $1/2$  width of an odontophore in males and juvenile females, each bearing transverse row of 3-6 teeth; tongue longer than wide, its posterior  $1/5 - 1/4$  not adherent to floor of mouth, posterior edge notched; short vocal slits posterolateral to tongue in adult males.

Dorsal surfaces fine shagreen lacking enlarged tubercles or folds; skin of side of head bearing numerous small warts; skin of throat smooth, no tubercles along lower lip, that of most of abdomen granular; discoidal folds prominent, well anterior to groin; no anal sheath but pair of small tubercles above vent; ulnar tubercles very low, even antebrachial; palmar tubercle bifid, larger than oval thenar tubercle; few supernumerary palmar tubercles; subarticular tubercles round, nonconical; fingers long and slender, lacking lateral keels or fringes (some slightly desiccated specimens manifest lateral keels); all fingers with broad ventral pads and round disks; disks of inner fingers slightly expanded, those of fingers III-IV about twice width of digit below disk; first finger longer than second when each is equally appressed; cream nuptial pads on thumbs of males.

Heel with minute to small tubercle; series of equal-sized tubercles along outer edge of tarsus; inner tarsal fold on distal  $1/4$  of tarsus, its proximal end bearing subconial tubercle; inner metatarsal tubercle  $2 \frac{1}{2}$  times as long as wide, 6-8 times size of round, subconical outer metatarsal tubercle; supernumerary plantar tubercles at bases of toes II-IV (and sometimes I and V), up to two proximal to base of toe IV; fringe along preaxial surface of toes (less evident along postaxial edge), no webbing; subarticular tubercles longer than wide, subconical (except round basal subarticular tubercle of toe V); toes

bearing broad disks (slightly smaller than those of fingers); tip of toe V reaches just beyond distal border of penultimate subarticular tubercle of toe IV, tip of toe III reaches to base of same tubercle; legs long, shank 67.9-70.9 % SVL in males, 56.6-69.8 % in females; heels broadly overlapping when flexed hindlimbs held perpendicular to sagittal plane.

**Color in ethanol.** Dorsum gray to brown with darker brown blotches dorsally (no defined pattern); side of head and flanks cream to pale brown with dark brown labial bars and canthal-supratympanic stripe; limb bars usually poorly defined, on shank forming chevrons about width of interspaces; anal triangle diffuse; anterior and posterior surfaces of thighs brown, sometimes with small clear spaces (not spots); ventral surfaces cream to white forming a median raphe on throat; throat lateral to raphe bearing black reticulum.

**Color in life.** Dorsal surfaces dark brown with irregular darker brown or orangish-brown spots; limbs reddish-brown with dark brown bands; posterior surfaces of thighs pale brown with no trace of pattern; throat gray with cream spots and median raphe; venter yellowish; iris yellow above, copper below with black reticulations (fieldnotes, Mariela Osorno).

**Measurements of holotype in mm.** SVL 26.8, shank 19.0, HW 10.6, head length 11.5, chord of head length 11.7, upper eyelid width 2.6, IOD 2.2, tympanum length 1.6, eye length 3.7, E-N 3.7.

**Natural history.** All specimens were found in either primary or well-conserved secondary forest and all were encountered in the immediate vicinity of streams.

**Remarks.** Nearly all specimens come from the lower part of the transect but the junior author obtained two at Rancho Quemado, which we view as being part of the upper section of the Caldas transect. Because the Rancho Quemado area was so intensively collected, and *E. fallax* was rarely found there, we think that this represents the upper limit of distribution for this species.

***Eleutherodactylus penelops* sp. nov.**

**Holotype:** Amphibian collection of Instituto de Ciencias Naturales, ICN 42459, an adult female, one of a series collected by V. Rueda, 24 Marzo 1994 (original number, PR 15885).

**Type-locality:** CALDAS, Samaná: carretera Samaná a Florencia, Km. 1.7, 1375 m.s.n.m.

**Paratopotype:** ICN 42459.

**Paratypes:** ANTIOQUIA, Municipio San Carlos: Hda. Las Vegas, 1180 m.s.n.m. (ICN 42424-25). Municipio San Luis: vereda El Silencio, Km 135 La Dorada-Medellín, 1010-1030 m.s.n.m. (ICN 15765). Municipio San Rafael: bosque de transmisión, Estadero El Bizcocho, 1200 m.s.n.m. (ICN 42423). CALDAS, Municipio Samaná: Km 5.8-7.0 carretera Samaná a La Cristalina, 1430-1500 m. (ICN 42458); ca. 6 km NW por trocha de vereda San Lucas, 1400 m.s.n.m. (IAvH 5592-93).

**Referred specimens (juveniles).** Caldas, Samaná: carretera hacia La Cristalina, Km. 5.6, Qda. Cristalina, 1350 m (ICN 42396). Km 5.8-7.0 carretera Samaná a La Cristalina, 1430-1500 m. (ICN 42456-57); carretera Samaná a Florencia, Km. 1.7, 1375 m. (ICN 42461).

**Etymology.** Greek, *penelops*, a kind of duck, used in reference to its call (duck-like).

**Diagnosis.** (1) Skin of dorsum shagreen with few pungent tubercles, venter areolate; no dorsolateral folds; (2) tympanum prominent, higher than long; (3) snout subacuminate in dorsal view, rounded in lateral profile; canthus rostralis evident; (4) upper eyelid as broad as IOD, bearing conical tubercle; no cranial crests; (5) vomerine odontophores prominent; (6) males with nuptial pad, lacking vocal slits; (7) first finger shorter than second; digits with expanded disks; (8) fingers bearing lateral fringes; (9) series of ulnar tubercles present; (10) conical tubercle on heel; short inner tarsal fold; small outer tarsal tubercles; (11) two metatarsal tubercles, inner oval, 4-6 times size of round outer; supernumerary plantar tubercles present; (12) toes bearing lateral fringes, no webbing; fifth toe very long; (13) dorsum dark brown, with or without cream blotches; venter brown with cream flecking; groin and concealed surfaces of limbs dark brown with large cream spots; (14) adults of moderate size, males 16.3-22.2 mm SVL, females 31.2-37.8 mm SVL.

Probably most closely related to (and similar to) *E. latidiscus* of the biogeographic Chocó from which it may distinguished in having a brown venter with cream flecking (in contrast to a cream venter with brown reticulation). Additionally, in *E. latidiscus*, adult females display flaring of the upper lips.

**Description** (proportions based on three adult males and on six adult and four juvenile females). Head not as wide as body, usually wider than long; HW 36.1-40.0 ( $\bar{x}$  = 38.4) % SVL in males, 37.4-41.6 ( $\bar{x}$  = 39.9  $\pm$  0.4) % in females; snout subacuminate in dorsal view, rounded in lateral profile; snout long, E-N 85.2-90.3 ( $\bar{x}$  = 86.1) % eye length in males, 78.4-95.6 ( $\bar{x}$  = 89.9  $\pm$  1.7) % in

females; nostrils weakly protuberant, directed laterally; canthus rostralis relatively distinct, edge rounded, sinuous; loreal region weakly concave, sloping abruptly to lips; upper eyelid bearing subconical tubercle on posterior third and several non-pungent tubercles; no cranial crests; upper eyelid width 95.2-109.1 ( $\bar{x} = 101.4$ ) % IOD in males, 92.1-103.1 ( $\bar{x} = 100.1 \pm 1.0$ ) % in females; supratympanic fold prominent, ending above insertion of arm; tympanum round in males, higher than long in females, directed posterolaterally; tympanum length 32.2-37.1 ( $\bar{x} = 34.2$ ) % eye length in males, 28.6-35.4 ( $\bar{x} = 30.8 \pm 1.0$ ) % in six adult females, 23.3-30.6 ( $\bar{x} = 25.8$ ) % in four juvenile females; postrictal tubercles subconical; postocular folds low; choanae round, well median of palatal shelf of maxillary arch; vomerine odontophores median and posterior to choanae, round, separated medially by distance equal to  $\frac{1}{2}$  to an odontophore width, each bearing 3-6 teeth in a transverse row; odontophores approximately  $1\frac{1}{2}$  times size of a choana; tongue broader than long, its posterior edge not notched, posterior  $\frac{2}{5}$  not adherent to floor of mouth; males lack vocal slits.

Skin of dorsum finely shagreen with some larger tubercles posteriorly and on flanks; no dorsolateral folds; skin of venter granular; discoidal folds prominent, well anterior to groin; upper surfaces of limbs shagreen; no anal sheath; subanal tubercles only slightly larger than granules on underside of thighs; ulnar tubercles nonconical, antebrachial largest; palmar tubercle bifid, much larger than oval thenar tubercle; numerous supernumerary palmar tubercles; subarticular tubercles round, subconical; fingers bearing fleshy lateral fringes and expanded disks with broad ventral pads; finger disks round, those of outer fingers larger than tympanum; disk of thumb narrower than those of other fingers (Fig. 1); first finger shorter than second; males with nuptial pad on thumb.

Conical tubercle on heel; outer edge of tarsus with nonconical tubercles; inner edge of tarsus bearing short fold on distal  $\frac{1}{5}$ ; inner metatarsal tubercle  $2\frac{1}{2}$  times as long as wide, 4-6 times size of rounded outer; numerous supernumerary plantar tubercles; subarticular tubercles round and subconical (distal subarticulars nonconical); toes bearing prominent lateral fringes but no webbing; toes bearing round, expanded disks as large as those of outer fingers; tip of toe V reaches to distal edge of distal subarticular tubercle of toe IV, tip of toe III reaches about  $\frac{1}{2}$  way between penultimate and distal subarticular tubercles of toe IV; hindlegs relatively long, heels overlapping when flexed hindlimbs held perpendicular to sagittal plane; shank 52.2-56.1 ( $\bar{x} = 54.7$ ) % SVL in males, 49.7-58.0 ( $\bar{x} = 53.6 \pm 0.7$ ) % in females.

**Color in ethanol.** Dorsum brown with cream blotches to dark brown with no markings; dark subocular bars; canthal stripe not apparent; supratympanic stripe dark brown; limb bars as broad as interspaces, oblique on shanks; venter brown with numerous cream flecks on abdomen; groin, lower flanks, anterior and posterior surfaces of thighs, concealed shank and tarsus brown with large cream spots.

**Color in life.** Dorsum dark or grayish brown to dark green with black markings (interocular bar, oblique flank bars, limb bars), ventral surfaces gray or dull orange with dense brown spotting (tending to coalesce) to a thick black reticulation; groin and concealed surfaces of limbs black with yellow to orange spots; inner digits yellow to orange; iris copper with black reticulum (based on field notes by M. Osorno, J. V. Rueda & P. M. Ruiz on file in the Laboratorio de Anfibios, ICN).

**Measurements of holotype in mm.** SVL 37.4, shank 19.5, HW 14.9, head length 14.5, chord of head length 15.5, upper eyelid width 3.5, IOD 3.8, tympanum length 1.5, eye length 4.9, E-N 4.5, width of disk of third finger 2.2.

**Natural history:** *Eleutherodactylus penelopus* is confined to well-forested streams and has not been found in forests away from streams. In Caldas, it was found in the gallery forests of streams winding their way through pastures. Mariela Osorno views the animal as uncommon, based on calls.

#### *Eleutherodactylus viejas* sp. nov.

**Holotype.** ICN 42426, an adult female obtained in January 1998. Amphibian collection of Instituto de Ciencias Naturales, by Mariela Orsono (field number MOM 1072).

**Type-locality.** ANTIOQUIA, Municipio San Carlos: carretera San Carlos a vereda Patio Bonito, Hda. Las Vegas, 1180 m.s.n.m.

**Paratopotypes.** Males (ICN 42427-29, 42435), females (42433-34) collected in January, February, and March 1998.

**Paratypes.** ANTIOQUIA, Amalfi: vereda El Jardín, Bosque Quebradoncita, 1000 m (MHUA 453). San Rafael: bosque San Rafael (ICN 42436-37). CALDAS, Samaná: carretera Samaná a Florencia, Km. 1.7, 1375 m.s.n.m. (ICN 42413). CUNDINAMARCA, Yacopí: Inpección de Policía de Guadualito, Cerro Colorado, 1190 m (ICN 42987), 1502 m (ICN 42980-81), vereda Barbascales, finca Montebello, 820 m (ICN 42984), vereda Sardinas, finca Matecaña, 1100-1120 m (ICN 42982, 42988-89).

**Referred Material** (juveniles). **Antioquia**, Municipio San Carlos: bosque de San Carlos (ICN 42430-32, 42441-45); Municipio San Rafael: bosque de San Rafael (ICN 42438-40, 42446). **Caldas**, Municipio Samaná: Km 23 carretera La Victoria a Samaná, Qda Tasajos con Río La Miel, 700 m (ICN 42409-10); carretera Samaná a Florencia, Km 1.7, 1375 m (ICN 42412); carretera Samaná a vereda California alta, Km. 1.6-3.0 (ICN 42411). **Cundinamarca**, Yacopí: Inpección de Policía de Guadualito, (ICN 42992), vereda Barbascales, finca Montebello, 820 m (ICN 42983, 42991, 43003), vereda Sardinias, finca Matecaña, 1100-1120 m (ICN 42990, 42998-99).

**Diagnosis.** (1) Skin of dorsum bearing numerous nonconical tubercles, that of venter areolate; no dorsolateral folds; (2) tympanum round, prominent,  $\frac{1}{4}$  to  $\frac{2}{5}$  length of eye; (3) snout subacuminate in dorsal view, rounded in lateral profile; snout long; (4) upper eyelid narrower than IOD, bearing small tubercle; no cranial crests; (5) vomerine odontophores prominent, oval, bearing slanted rows of teeth; (6) males with vocal slits and nuptial pads; (7) first finger shorter than second, fingers bearing round disks; (8) ulnar tubercles forming row, not prominent; (9) fingers bearing lateral fringes; (10) tubercle on heel nonconical, smaller tubercles on outer edge of tarsus, fold-like tubercle on inner edge of tarsus; (11) two metatarsal tubercles, inner oval, much larger than outer; numerous supernumerary plantar tubercles; (12) toes bearing lateral fringes; fifth toe very long; (13) brown above with darker brown markings; venter cream, stippled with brown, heaviest on throat; posterior surfaces of thighs brown with large cream spots; no canthal stripe; (14) adults small, males 15.3-19.1 ( $\bar{x} = 17.7 \pm 0.5$ ) mm SVL, females 24.0-29.1 ( $\bar{x} = 26.8 \pm 0.5$ ) mm SVL.

Superficially similar to *E. taeniatus* in that it lacks a canthal stripe and is a small brown frog of the *E. unistrigatus* group. From all species associated with the complex by Flores & Vigle (1994), *E. viejas* is readily distinguished in having orange spots on the concealed surfaces of the limbs.

**Etymology.** The specific epithet is Spanish (a modismo in Colombia, meaning pretty young women) and is used as a noun in apposition. The name is given for three biologists (Jeannette Nieto, Mariela Osorno, and Claudia Vélez) who have observed the species in great detail in forest fragments of southeastern Antioquia.

**Description** (proportions based on nine males and 15 females). Head broader than (males, immature females) to slightly narrower than (gravid females) body,

wider than long; HW 35.4-41.0 ( $\bar{x} = 39.0 \pm 0.6$ ) % SVL in males, 38.0-40.5 ( $\bar{x} = 40.6 \pm 0.4$ ) % in females; snout subacuminate in dorsal view, rounded in lateral profile; E-N 77.8-100.0 ( $\bar{x} = 86.4 \pm 2.7$ ) % eye length in males, 85.2-108.6 ( $\bar{x} = 97.5 \pm 1.8$ ) % in females; nostrils protuberant, directed laterally; canthus rostralis relatively sharp, sinuous; loreal region concave, sloping abruptly to lips; lips not flared, even in large females; nonconical tubercle on posterior half of upper eyelid; upper eyelid width 60.0-85.7 ( $\bar{x} = 73.9 \pm 3.0$ ) % IOD in males, 59.1-86.7 ( $\bar{x} = 73.7 \pm 2.0$ ) % in females; no cranial crests; supratympanic fold short, above and behind tympanum; tympanum round, prominent, separated from eye by its own diameter; tympanum length 26.1-36.0 ( $\bar{x} = 29.9 \pm 1.0$ ) % eye length in males, 29.0-40.0 ( $\bar{x} = 32.8 \pm 0.9$ ) % in females; postrectal tubercles nonconical or slightly subconical; choanae round, well median of palatal shelf of maxillary arch; vomerine odontophores median and posterior to choanae, oval, separated medially by distance equal to  $\frac{2}{3}$  to entire width of an odontophore, each between  $\frac{1}{2}$  size of to slightly larger than a choana, bearing a slanted row of up to four teeth; tongue longer than wide, its posterior border bearing feeble notch, posterior  $\frac{1}{3}$  not adherent to floor of mouth; males with subgular vocal sac, vocal slits short, posterolateral to tongue.

Skin of dorsum bearing numerous nonconical tubercles, fewest found on snout; no dorsolateral folds; no anal sheath or perianal tubercles; discoidal folds just anterior to groin; 3-5 ulnar tubercles, antebrachial largest (often only one pungent); palmar tubercle bifid, much larger than oval thenar tubercle; supernumerary palmar tubercles prominent; subarticular tubercles round, subconical; fingers bearing lateral fringes and large round disks; first finger shorter than second; males with white nuptial pad on thumb.

Tubercle on heel nonconical; smaller tubercles along outer edge of tarsus; fold-like tubercle at mid-tarsus on inner edge of tarsus; inner metatarsal tubercle 2.5 times as long as wide, about eight times size of oval outer metatarsal tubercle; numerous supernumerary plantar tubercles, arranged in rows; subarticular tubercles round, subconical; toes bearing lateral fringes, no webbing; toe disks round, expanded, smaller than those of outer fingers; tip of toe V reaches distal edge of distal subarticular tubercle of toe IV, that of toe III reaches distal edge of penultimate subarticular tubercle of toe IV; heels broadly overlapping when flexed hindlegs held perpendicular to sagittal plane; shank 57.1-61.4 ( $\bar{x} = 58.8 \pm 0.5$ ) % SVL in males, 52.7-61.4 ( $\bar{x} = 57.1 \pm 0.7$ ) % in females.

**Coloration in ethanol.** Dorsum brown with darker brown interorbital bar, scapular and sacral chevrons, suprainguinal bar; supratympanic stripe and labial bars dark brown; limb bars narrower than interspaces, perpendicular on shanks; broad cream line above vent and dark brown anal triangle; dark brown field on posterior surfaces of thighs bearing large cream spots; anterior surfaces of thighs dark brown, occasionally with cream spots toward groin; groin cream, sharply set off from dark pigment on anterior surfaces of thighs; ventral surfaces cream with brown stipple, heaviest on throat and undersides of limbs.

**Color in life.** Dorsum copper brown to dark brown with irregular-shaped cream, nearly black, or orange spots. Flanks dark brown with pale brown slanting stripes. Posterior surfaces of thighs dark brown with orange spots. Venter nearly white to pinkish with pale spots, with or without gray marbling on throat. Iris pale copper to reddish-copper with thick black reticulum (fieldnotes of M. Osorno).

**Measurements of holotype in mm.** SVL 26.8, shank 15.5, HW 11.3, head length 10.5, chord of head length 11.3, upper eyelid width 2.2, IOD 3.3, tympanum length 1.2, eye length 3.4, E-N 3.5.

**Remarks.** *Eleutherodactylus viejas* may be a species of the phenetic *E. frater* group (Flores & Vigle, 1994). If so, it is one of the two trans-Andean lowland species (*E. taeniatus* is the other). The remaining trans-Andean species (*E. miyatai*, *E. ptichus*, and *E. suetus*) are cloud-forest species but the alpha taxonomy of the trans-Andean members of this complex remains to be completed (Lynch & Ardila-R., MS). Although M. Osorno found this species to be exclusive to forests in the lowlands of eastern Antioquia, JDL has seen specimens from abandoned pastures in the much more mesic cloud forests of municipio Guatapé.

At present, we view *E. viejas* as most similar to *E. miyatai* and *E. taeniatus*. The three are readily separated based on coloration and *E. viejas* has narrower digital disks than do the other two (Fig. 2).

### Discussion

With these descriptions, we think we have identified all *Eleutherodactylus* species except one found on the Caldas transect. The one remaining species is a single

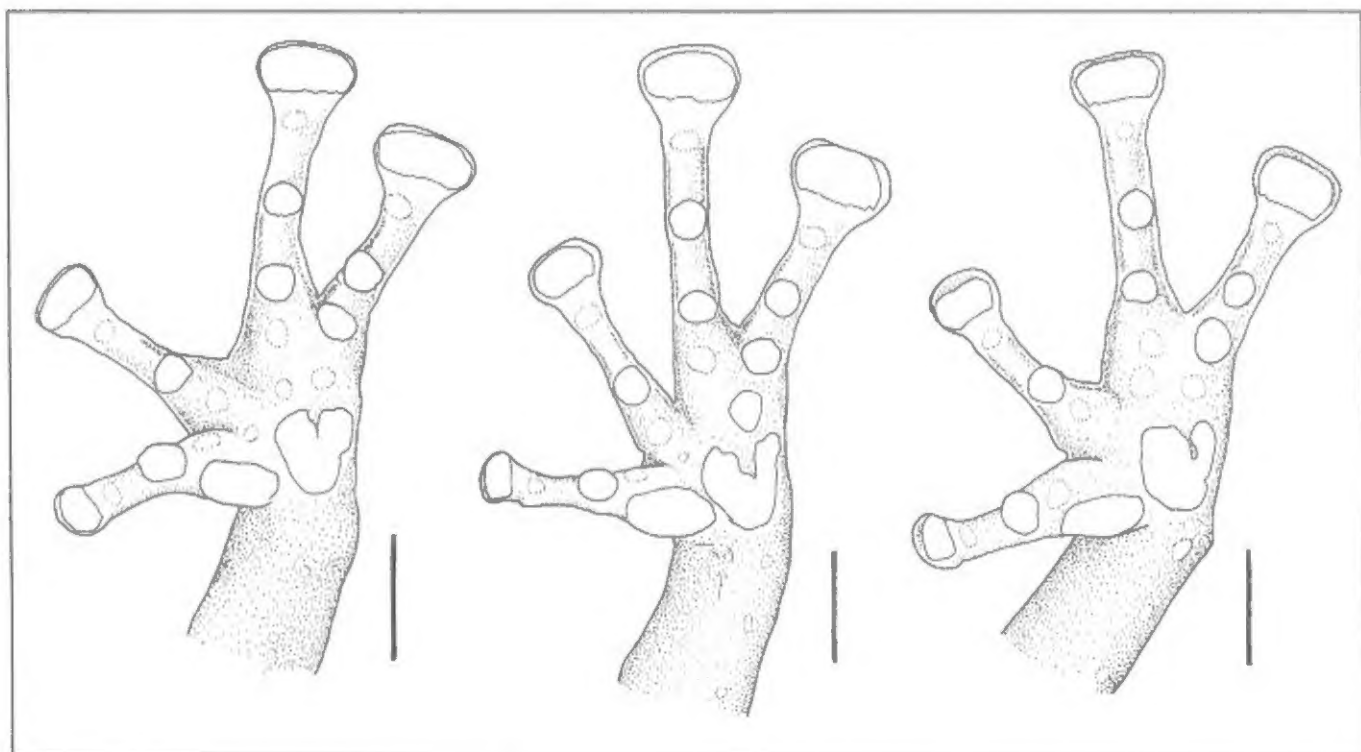


Figure 2. Palmar views of hands of three species of the *Eleutherodactylus taeniatus* complex. (Left) *E. miyatai* (ICN 15267), (Middle) *E. taeniatus* (ICN 31855), and (Right) *E. viejas* (ICN 42433). Scales equal 2 mm.

specimen (from 700 m.) of an undescribed species of the *E. diastema* group and is included in a manuscript on that group by JDL.

The upper part of the transect (1800 to 2450 m) harbors 20 species of *Eleutherodactylus* whereas the lower part (600 to 1600 m) harbors only nine (*E. bufoniformis*, *E. fallax*, *E. gaigei*, *E. orpacobates*, *E. penelopus*, *E. raniformis*, *E. taeniatus*, *E. viejas*, and the undescribed species).

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